

## The PinK Study - Methodology of the Follow-up Survey of a Cohort Study of Couples Undergoing Fertility Treatment

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# **The PinK Study – Methodology of the Follow-up Survey of a Cohort Study of Couples Undergoing Fertility Treatment**

## **Abstract**

The paper describes the follow-up survey of the PinK study ‘Paare in Kinderwunschbehandlung’ (couples undergoing fertility treatment). This interdisciplinary study aims at a broader and better understanding of the situation of couples with an unfulfilled desire to have a child. The focus in the follow-up survey is on the situation of the couples one year after their first visit to a fertility clinic in Rhineland-Palatinate or in the capital of Hesse, Wiesbaden. Approximately one year after the baseline survey, self-administered questionnaires were sent to respondents who had signed a written agreement to remain in the study. The field period lasted from June 2013 to August 2014. The final sample consists of 140 women and 93 men. In 89 couples both partners participated. The longitudinal data set includes 224 respondents. The share of baseline survey participants who also participated in the follow-up is 39.6 %. This report describes the study design and materials for the follow-up as well as the sample and analyses the selectivity of dropouts from the baseline sample.

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## 1 Introduction

The study ‘PinK – Paare in Kinderwunschbehandlung’ (couples undergoing fertility treatment) is a prospective cohort study of couples with an unfulfilled desire to have a child who consecutively presented themselves at a fertility clinic in the German state of Rhineland-Palatinate (RP) or in the capital city of the state of Hesse, Wiesbaden between July 2013 and August 2014.

The interdisciplinary survey was organised by the PinK research group, which consists of researchers from four institutions: the Institute of Occupational, Social and Environmental Medicine at the University Medical Centre of the Johannes Gutenberg University Mainz (ASU); the Federal Institute for Population Research, Wiesbaden (BiB); Evangelische Hochschule Darmstadt – University of Applied Sciences (EHD) and the Department of Gynaecological Endocrinology and Reproductive Medicine at the University Medical Centre of the Johannes Gutenberg University Mainz.

Two cycles of data collection were conducted: a baseline survey and a follow-up survey. While the purpose of the baseline survey was to gather information about couples at the beginning of their treatment at a fertility clinic, for example to better understand the pathways leading to fertility treatment, the follow-up survey was established to gain insights into the couples’ situation approximately one year later.

The design of the follow-up study and the questionnaire employed are guided by the following research questions:

- How did the fertility treatment proceed?
- What possible burdens are connected to fertility treatment in different spheres of life?
- Does infertility and the treatment experience have an effect on the couple and how do they cope with (treatment-related) stress?
- Which kinds of psychosocial support are known to patients and which ones are used?

The effects of different independent variables, such as success of treatment and the health status of children born will be included in the analysis.

After this brief introduction we describe the study design in detail (Section 2), followed by a description of the study materials used (Section 3). Section 4 provides information on the response rate, followed by a description of the final data set in Section 5. The process of data handling and editing, the matching of respondents between baseline and follow-up and the matching of partners are covered in this section as well. Additionally, the sample of the follow-up study is described in terms of their status of treatment and socio-demographic characteristics compared to the baseline sample and the selectivity of dropouts is investigated. Section 6 summarises the value of the follow-up study, its strengths, methodological problems and the possible insights it can provide.

## 2 Study Design

This section will begin with some brief information about the baseline survey followed by a more detailed description of the design of the PinK Study follow-up survey. Data for the baseline survey were collected with self-administered questionnaires between July 2012 and July 2013. The questionnaires were handed out to heterosexual couples who were about to commence fertility treatment at one of six fertility clinics in the German federal



state of Rhineland-Palatinate or in Wiesbaden (Hesse). Completed questionnaires were returned by mail to the ASU (Institute of Occupational, Social and Environmental Medicine at the University Medical Center of the Johannes Gutenberg University Mainz), the study centre of the baseline survey. The final sample of the baseline survey consisted of 323 women and 242 men, including 234 couples. Theoretical background, research questions and the methodology of the baseline survey were described in detail elsewhere (Passet-Wittig et al. 2014).

At the end of the baseline questionnaire, the respondents were asked if they were willing to participate in a follow-up study. If they agreed, they were asked to provide their postal address and email address on a contact form and send it by post to the BiB (Federal Institute for Population Research), the study centre of the follow-up survey. As the baseline survey questionnaires were returned to the ASU, anonymity of respondents was secured as questionnaire and contact form could not be linked. At the BiB, a data set with contact information for each respondent was generated, including name, postal address, e-mail address and return date of the contact form.<sup>1</sup> The database was sorted according to the return date in order to be able to contact respondents approximately one year after their first participation in the study.

In an additional step, the database was scanned for couples according to shared last name and/or shared address. The second responding partner was then placed together with the first responding partner. This was done in order to be able to contact them on the same date and to be able to send them questionnaires with corresponding serial numbers. This would allow us to match couples in the data set of the follow-up. The timing of the renewed contact was based on the date of the baseline questionnaire of the first partner. It is therefore possible that some participants of the baseline survey were contacted for the follow-up after a shorter interval than originally intended. Most contact forms of partners were received in the same week, if not the time difference was mostly less than a month and seldom more.

As in the baseline survey, the method of data collection in the follow-up study was self-administered questionnaires. This time, questionnaires were distributed by post and not via the fertility clinics in order to possibly include all former participants, even those who did not start or continue with their intended treatment. The questionnaires were returned to the ASU in stamped return envelopes that were provided together with the questionnaires.

Overall, the follow-up consists of a letter announcing the upcoming follow-up study, which was sent eleven months after the arrival of the contact form at the BiB, the main dispatch of study packages (see Table 1), which were sent one month later, and a reminder (including another questionnaire, see Table 1) if no questionnaire was returned to the ASU four weeks after the main dispatch. Materials were sent out by post every month on a Wednesday or Thursday of the last full week of the month so that they would be received by the participants towards the weekend. The field period started in June 2013 with the dispatch of the first announcement letters. The final reminders were sent in August 2014. Participating couples were contacted separately if both partners gave their consent for the follow-up study. In any case where only one partner agreed to be contacted for the follow-up survey, the study packages included an extra set of study materials for their partner. In the informative letter, these main respondents were asked to pass this on to their partner. The aim of this procedure was to include as many couples as possible in the follow-up.

The cover sheet of each questionnaire contains a serial number that was also assigned to the respondents in the address database of the BiB. The serial number consists of four digits and allowed us to identify female and male respondents and couples. This serial

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<sup>1</sup> In the description of the follow-up survey those persons who directly agreed to be contacted for the follow-up are called 'main respondents'.

number was used solely for response monitoring. Upon arrival of the questionnaires at the ASU, the title page was detached from the questionnaires and serial numbers were transmitted to the BiB, where the response monitoring was managed and the title pages were then discarded. This ensured that it would not be possible to match the follow-up questionnaires and the names and addresses. At the ASU, the questionnaires were then scanned and converted into electronic format. If no questionnaire was returned to the ASU four weeks after the dispatch of the study packages, the main respondents received a reminder. If the partner of the main respondent had not yet returned a questionnaire, study materials for the partner were included again. At the end of the field period all personal data were deleted.

Additionally, every questionnaire was assigned an ID, which was printed at the bottom of every page of each questionnaire. This ID was different from the serial number on the cover sheets and not linked to it in any way. The ID is included in the data set and is only used to identify couples and to differentiate between questionnaires from the main dispatch and the reminder. Since the serial numbers differ, it was only possible to match partners using this serial number if both partners returned their questionnaires from either the main dispatch or the reminder (see Section 5.2).

In order to be able to match respondents' questionnaires from the baseline and the follow-up survey, respondents were asked to create the same personal code in both surveys. The code consists of five parts with a overall length of nine characters. For each part, the respondents were asked to provide letters or numbers for time-constant characteristics. The matching procedure is described in more detail in Section 5.2.

Respondents were asked again whether they agreed to participate in a further follow-up study. If they agreed, they had to fill in the contact form that was part of the study package. For anonymity's sake, two stamped return envelopes were attached to the study package. One was for the filled in questionnaire, which was addressed to the ASU. The other one was for the contact form, which was addressed to the BiB. As with the baseline survey, contact information and questionnaire were stored in different institutions and cannot be linked.

Study design and materials were approved by the Data Protection Commissioner of Rhineland-Palatinate and the Ethics Committee of the State Board of Physicians of Rhineland Palatinate.

### **3 Study Materials**

This section provides a detailed description of the materials that were sent to the possible participants in the follow-up survey: the content and appearance of the letters and the questionnaire and the origin of questions.

#### **3.1 Study Packages**

Study materials were available in the German language. Study packages were sent to the main respondents by post approximately one year after their participation in the baseline survey. If both partners consented to participate in the follow-up study (both 'main respondents'), they were addressed separately. For the cases where the database with the contact information did not make clear whether both partners had given their consent, study materials for the partners were attached to the package of the persons who had consented to be contacted again (see above). Materials were similar for both



sexes. Letters were adapted to gender and the questionnaires were slightly different. The following paragraphs describe the materials in detail.

**Table 1: Overview of study materials for the PinK Study follow-up survey**

No.		Main respondent	Partner <sup>1</sup>
1	Advance notice	Announcement letter	
2	Main dispatch	Informative letter Questionnaire Stamped return envelope (ASU) for questionnaire (A4 format) Contact form (follow-up survey) Stamped return envelope (BiB) for contact form (long format)	Informative letter Questionnaire Stamped return envelope (ASU) for questionnaire (A4 format) Contact form (follow-up survey) Stamped return envelope (BiB) for contact form (long format)
3	Reminder	Informative letter Questionnaire Stamped return envelope (ASU) for questionnaire (A4 format) Contact form (follow-up survey) Stamped return envelope (BiB) for contact form (long format)	Informative letter Questionnaire Stamped return envelope (ASU) for questionnaire (A4 format) Contact form (follow-up survey) Stamped return envelope (BiB) for contact form (long format)

<sup>1</sup> Study materials for the partner were included if the partner could not be directly addressed in the follow-up study.

The announcement letter was only sent to those who had given consent to be contacted for the follow-up survey. The main respondents were thanked for their participation in the baseline survey. The letter announced the dispatch of the study packages for the follow-up and explained why their participation was important. Furthermore, it ensured the anonymity and voluntariness of participation. Participants were asked if their addresses had changed and, if this was the case, to provide the new address via e-mail or telephone. Name, phone number, e-mail address and postal address of a contact person at the study centre (BiB) were provided.

There are three versions of the informative letter that was sent with the questionnaire: one for main respondents with consenting partners, one for main respondents without consenting partners, and one for the respective partners. The content is very similar. It explains the importance and aims of the follow-up study, voluntariness and arrangements concerning anonymity. It also explains that the serial number printed on the cover sheet of the questionnaire and the ID on the questionnaire are used for response monitoring only. The possible respondents are asked to complete the questionnaire alone at home, without interruption and without consulting their partner, and to send it back in the enclosed envelope. Furthermore a short guide on how to fill in the questionnaire is printed on the back of the informative letter. The letter is signed by the three principal researchers of the follow-up survey. If study materials for the partner were attached, the informative letter was slightly modified. The main respondent is asked to pass on the attached study materials to the partner. The letter emphasises that the decision to comply with this request is completely up to them and that the partners' participation is voluntary. The study materials for the corresponding partners also include an informative letter. It informs the partners why they received the study materials and that it is important for us to include as many couples as possible.

The informative letter for the reminder was only slightly modified in comparison to the main dispatch. The chief difference was that possible respondents were asked to use the

questionnaire sent with the reminder and to throw away the questionnaire from the main dispatch if they had not already done so. The reason for this request was to get a better impression of the effect of sending a reminder.

Generally, to increase recognition the study materials were designed in a very similar fashion as for the baseline survey. The PinK logo was printed on all letters and on the cover sheet of the questionnaire (see Appendix 8.1 for an example of the cover sheet). It was accompanied by the logos of the participating research institutions to underline the scientific character of the study. The informative letters and the cover sheet of the questionnaire contain contact information (e-mail address and telephone number) in case respondents have any questions.

### 3.2 Questionnaire

Different groups had to be addressed in the follow-up survey: those who were still undergoing treatment, those who interrupted or ultimately ceased treatment and those who were expecting or had already had a baby. The distribution of these groups is described in Section 5.3.

As for the baseline survey, the questionnaire for the follow-up survey covers several different topics and is divided into several modules. On the first page of the questionnaire, the respondents are asked to create a personal code. The aim of the first module is to gain insights into the fertility treatment during the period between the surveys. The second module focusses on the respondent's personal treatment experiences. Respondents are asked if treatment was stressful for them and in what respect. Effects of the treatment on different spheres of life are covered as well. Module 3 covers different sources of help for coping, focussing on different types of counselling. The next section deals with the financing of treatment. Respondents are asked about their employment and financial situation, insurance coverage of the treatment and own expenses (Module 4). The questionnaire continues with questions about changes in the respondents' relationship status and questions about the current relationship (Module 5). This is followed by a section about the handling of stress in the partnership (Module 6). Module 7 covers attitudes towards family and life goals. Health issues are addressed in Module 8, while Module 9 gathers information on children born between surveys. The final section informs respondents about a potential second follow-up survey and asks if they are interested in participating. If so, they are asked to fill in the attached contact form and to return it in the stamped envelope. The questionnaire closes with a final open-ended question concerning aspects of the topic not mentioned or other issues the respondent would like to address. Socio-demographic information was covered in some detail in the baseline questionnaire. In this respect, the follow-up questionnaire is only used to update some information provided by the baseline study.

In total, the questionnaire contains 57 questions. If feasible, closed-ended questions were used. Some items from the baseline survey were repeated, this includes several scales from other surveys. Also new questions were added. These were either taken from other surveys or developed for the specific purpose of the study. Sources for some of the new questions in the follow-up were the Danish Multi-Centre Psychosocial Infertility Research Program (COMPI, Schmidt 2006), the German Family Panel (pairfam, Huinink et al. 2011), the German Generations and Gender Survey (GGS, Ruckdeschel et al. 2009), a short research version of a scale on dyadic coping of couples (Bodenmann 2012) and a questionnaire on the specific attachment type of couples (BBE, Asendorpf et al. 1997; Klann et al. 2003). If necessary, consent for the use of questions was obtained from the authors prior to the creation of the questionnaire.

Questionnaires for the two sexes differ only slightly. Some items were changed and wording was adapted to gender. The 22 pages of the questionnaire were printed duplex in A4 format and designed to be automatically scanned and converted into electronic format using document scanner and forms processing software (Scanner: Kodak i60, Kodak GmbH, Stuttgart, Germany; Software: ReadSoft Eyes & Hands Forms, Readsoft AG, Frankfurt/Main, Germany).

## 4 Response Rate

This chapter reports the overall response rate for the follow-up survey and the participation rate for those respondents only who had agreed to participate in the follow-up and their partners.

Table 2 shows the response rate of the follow-up survey. 565 persons participated in the baseline survey of the PinK Study. This group forms the denominator in the calculation of the overall response rate. In a few cases ( $n=9$ ), letters sent were undeliverable and returned to the study centre. The procedure was as follows for these cases: 1. Spelling was checked again with the original contact form to rule out misinterpretation of handwriting. 2. If respondents provided an e-mail address, they were contacted via e-mail. 3. If the e-mail was not answered or no e-mail address was provided, the registration office was contacted. This made it possible to correct addresses or use new addresses in all cases. Overall, 236 questionnaires were returned to the ASU. Two of these were returned empty, one person returned two questionnaires (main dispatch and reminder), which was obvious because the corresponding personal codes were identical. The first questionnaire was kept and the other one was deleted from the data set.

The overall response rate for the follow-up survey was calculated as the number of follow-up survey respondents divided by the total number of participants in the baseline survey. Follow-up survey participants could only be included if it was possible to match them across waves using their personal code. Of all 233 follow-up survey respondents this was possible for 224 respondents (cf. Section 5.2). The overall response rate for the follow-up survey was 39.6 %. A selectivity analysis is performed in Section 5.3.

**Table 2: Overall response rate of the follow-up survey**

	Total
Baseline survey respondents	565
Total number of questionnaires returned for follow-up survey (gross)	236
Number of valid follow-up questionnaires returned for follow-up survey (net)	233
Follow-up survey respondents with successful match across waves <sup>1</sup>	224
Overall response rate (%)	39.6

<sup>1</sup> For a detailed description of the matching procedure see Section 5.2.

Source: PinK Study, own calculations.

Another way to investigate the success of the follow-up survey is to use the group of persons who received a study package as a starting point. This includes main respondents who had returned a contact form and thereby agreed to be contacted again and their partners who did not agree, but were addressed through their partners. Of the 565 respondents of the baseline survey, 293 had agreed to be contacted for the follow-up survey. In 192 cases they were part of a couple ( $n=96$  couples) and in 101 cases only

one person out of the couple had consented to participate in the follow-up. Altogether, 394 questionnaires were sent for the follow-up survey. Table 4 shows the probability of participation in the follow-up survey for those who were addressed directly and indirectly as described above.<sup>2</sup> Overall, 59 % of those addressed participated again in the follow-up. The percentage is considerably higher for women than for men. This is most likely a result of the fact that more questionnaires were sent to male partners who had not consented to be contacted again for the follow-up survey than to female partners. The motivation of this group to be part of the follow-up study was probably lower in general. Additionally we do not know in how many cases the additional questionnaires were actually passed on to the partners.

Table 3 also differentiates between the main dispatch and reminder in order to see how the use of a reminder affected the participation rate. It becomes clear that the reminder increased the overall share of participants by 6.9 percentage points, which equals 11.6 % of all questionnaires returned. The assignment to main dispatch and reminder is based on the ID printed on the questionnaires (see Section 2). One has to keep in mind that respondents might have sent back the questionnaire from the main dispatch after receiving the reminder (even though they were asked to do otherwise) and therefore the positive effect of the reminder might be underestimated.

**Table 3: Follow-up survey participation rate for main dispatch and reminder for baseline participants who had agreed to be contacted again for follow-up survey and their partners, by gender**

		Women	Men	Total
Overall (main dispatch & reminder)	No. of questionnaires sent	197	197	394
	No. returned (gross)	144	93	236
	No. returned (net, valid)	140	93	233
	Participation rate (%, only valid)	71.1	47.2	59.1
Main Dispatch Only	No. returned (gross)	129	79	208
	No. returned (net, valid)	127	79	206
	Participation rate (%, only valid)	64.5	40.1	52.3
Reminder Only	No. returned (gross)	15	14	29
	No. returned (net, valid)	13	14	27
	Participation rate (%, only valid )	6.6	7.1	6.9
	Percentage of no. returned (%, total valid)	9.3	15.1	11.6

Source: PinK Study, own calculations.

## 5 Final Data Set

This chapter describes the data set and its processing. The first section explains the steps taken in data handling and editing and the computation of basic socio-demographic variables. The second section describes the composition of the final sample. The distribution of socio-demographic characteristics of respondents from the follow-up in comparison to the baseline survey is also presented.

<sup>2</sup> Please note that it is not possible to differentiate between main respondents (those who agreed to be contacted again) and partners since this information is not available in the data set.

## 5.1 Data Handling and Editing

The data were processed using SPSS 21 (IBM Corp. Released 2011, IBM SPSS Statistics for Windows, Version 20.0 Armonk, NY: IBM Corp.). Female and male questionnaires differ slightly and were therefore scanned and converted to electronic format separately. Before combining them into one data set, question and item numbers were standardised based on the female questionnaire.

Data were edited according to the procedure followed in the baseline survey: defining missing values, checking value ranges, checking filters, coding open answers, computing basic variables. A detailed description of the process can be found in Passet-Wittig et al. (2014: 17). Only the computation of new basic variables will be explained here.

The data set also includes variables that were not part of the questionnaire, but are computed based on available information in the data set. A missing code was applied for the generated variables if the information was incomplete. The wording of questions and answer categories, on which the construction of these variables is based, are available in Appendix 8.2 (cf. Passet-Wittig et al. 2014: 31-34).

*Status of treatment.* This variable reports the status of fertility treatment of respondents at the moment of data collection. The categories are ‘currently pregnant’, ‘had a child’, ‘currently undergoing treatment’ and ‘currently not undergoing treatment’. Respondents were asked if they (or their partners) were pregnant or had a child in the last year. This information was used for the categories ‘currently pregnant’ and ‘had a child’. In cases where neither of these two categories applied, we checked whether they had visited a fertility clinic within a months’ time. If their last visit was more than a month ago, they were asked if they were still patients at a fertility clinic. Respondents who stated that they had just visited the clinic at most a month ago or they were still patients at a clinic were assigned to the category ‘currently undergoing treatment’. All other respondents who had not visited the fertility clinic lately were assigned to the category ‘currently not undergoing treatment’.

*Labor force status.* This variable describes the respondent’s current labor force status. The variable was already computed for the baseline data set and is described in detail in Passet-Wittig et al. (2014: 18f). It is based on a question on the current activities of the respondent, which was adopted from the first wave pairfam partner questionnaire (pairfam 2013). For the follow-up questionnaire, the list of activities was shortened from 21 to 10 activities and some categories were combined. The list of educational activities was reduced from 8 to 2, differentiating only between ‘university education’ and ‘vocational training/vocational retraining/continuing education’. The list of work-related activities was reduced from 7 to 3: ‘full-time employment’, ‘part-time employment’ and ‘marginal part-time employment/occasionally or irregularly employed’. From the list of six non-work activities, only ‘alternative civilian service/voluntary social service year’ was deleted. Originally, all 3 types of activities included one residual category labelled ‘other education/work/non-work activity,’ which was combined into one category simply labelled ‘other’.

*Parity.* This variable also exists in the first survey’s data set (Passet-Wittig et al. 2014: 18). Parity was not inquired directly in the follow-up survey. Instead the respondents were asked if they had had any children within the last 12 months and if they answered ‘yes’ they were asked how many children they had. To build a variable for the current parity, the data sets from the baseline and the follow-up survey (described below) had to be merged. The number of newborn children in the follow-up survey was then added to the number of children respondents had mentioned at the baseline. Respondents with a missing value in either of the two indicators were assigned a missing value in the variable for the follow-up survey.

*Relationship status.* In the follow-up survey, respondents were asked if they were still in a relationship with their partner from the baseline survey and if they were married to their current partner. Using this information, the relationship status from the first study was updated.

Two cross-sectional data sets for the follow-up survey and one longitudinal data set were produced. The first cross-sectional data set contains all individual respondents who are presented with one row for each respondent (n=233). A second data set was set up in wide format which contains only the couples' information with one row for each couple (n=89). The longitudinal data set contains all respondents who participated in the baseline and follow-up survey (n=224). The matching of partners and the matching across surveys will be described in more detail in the following section.

## **5.2 Matching Partners and Matching Across Surveys**

Compared to the baseline survey, the procedure for matching partners was more complex in the follow-up. The ID on each page of the questionnaire could only be used to match partners if both partners had sent their questionnaires from either the main dispatch or the follow-up, since the ID in the main and follow-up dispatch differ. If one partner participated in the main dispatch and one partner in the reminder, matching was only possible if the person was part of a couple in which both partners had participated in the baseline survey and matching across surveys was successful for this person (read the next paragraph for more information on matching across surveys). Direct matching of partners was possible for 78 couples, 11 additional couples were matched using information from the baseline survey. Checks were performed to reduce the risk of false matches. Information from several questions in the follow-up survey should correspond between partners because these questions concern the couple's experience. This includes information on pregnancies, births, treatments performed, couple's use of counselling, type of health insurance of both partners. Major differences were found concerning pregnancies and births only in two couples, but these could be explained by the different points in time when they filled in the questionnaire.

As explained earlier, the participants in the baseline survey who agreed to take part in the follow-up study were asked to create a personal code. The code consists of five units, based on five questions that asked for time constant characteristics of respondents (wording of the question is available in Appendix 8.3). Four questions asked for letters and one for a two-digit number. Of these five questions, four required that the respondents write down two letters or numbers and one required only one letter. The questionnaire of the follow-up survey contained the same instructions for the creation of a personal code. There was no item non-response on this question in the follow-up survey. At best the participants created the same personal code in both surveys. It was easy to match these cases. Of all 233 respondents, 138 personal codes have an exact match in the baseline survey (Table 4). For the remaining codes from the follow-up survey, matches were searched for manually. For this purpose, sequences of the codes were compared with the codes from the baseline survey. This procedure was used repeatedly, reducing the number of identical units required for a match. In this way 69 further matches were found. Of these, 56 cases were identical in 4 of 5 units, 11 cases were identical in 3 of 5 units and 2 cases were identical in 2 of 5 units. In order to validate whether these matches belong to the same person, respondents' sex and age were compared across baseline and follow-up survey. No relevant deviations appeared according to these variables, thereby verifying successful matches.

For the remaining 26 cases, no matching code could be identified using the procedure described above. Most likely these respondents were partners of main respondents (see



Section 2). Some of these respondents might have participated in the baseline survey but did not generate a personal code and were not interested to be contacted for the follow-up survey. Accordingly, we tried to match these respondents using information about their partners. To match using partner information some preconditions had to be fulfilled: The partner must have participated in the follow-up study and be identified as a partner; the partner must have a match in the baseline survey and must be matched to his/her partner in the baseline survey.<sup>3</sup> A match across surveys was possible for 17 additional cases. Again, a check was performed using the age of both partners in both surveys. No meaningful differences were found. Ultimately, a matching of the data sets from the baseline and follow-up survey was not possible in only 9 cases (4 women and 5 men).

**Table 4: Types of matches between baseline and follow-up survey**

Matches between baseline and follow-up survey	Women	Men	Total
No match	4	5	9
Exact matches	93	45	138
Matches with error tolerance	39	30	69
Matches using partner information	4	13	17
Total	140	93	233

Source: PinK Study.

### 5.3 Description of the Sample and Selectivity Analysis of Dropouts

This section will first describe what happened to the respondents after their initial participation in the survey. Specifically, we are interested in how many were successful in their attempt to have a child, how many are still undergoing treatment or have currently stopped treatment without success. This is followed by a more detailed description of the sample with respect to their socio-demographic characteristics compared to the baseline. Furthermore, we will analyse the selectivity of dropouts.

The distribution of the generated variable ‘status of treatment’ is shown in Table 5. 22.9 % of the women state that they are currently pregnant and 24.7 % of the men state that their partners are pregnant. 32.1 % of the women and 31.2 % of the men already had a child since the first survey. 28.6 % of women and 28 % of men state that they are still undergoing treatment and 15.7 % of women and 15.1 % of men have either interrupted or ceased treatment. The distribution can probably be partly explained by the lower motivation to participate in the follow-up study among respondents whose fertility treatments were unsuccessful due to frustration, while respondents whose treatment was successful are more willing to participate in the follow-up survey.

<sup>3</sup> Information in the questionnaire was used to also check whether there were changes in the relationship status across surveys. There was no evidence of a union dissolution and a new partner in any of the cases.

**Table 5: Distribution of the status of treatment in the follow-up survey population**

	Women		Men	
	n	%	n	%
Currently pregnant/expecting children	32	22.9	23	24.7
Had a child	45	32.1	29	31.2
Currently undergoing treatment	40	28.6	26	28.0
Currently not undergoing treatment	22	15.7	14	15.1
Missing information	1	0.7	1	1.1
Total	140	100.0	93	100.0

Source: PinK Study, own calculations.

Table 6 shows the frequency distribution of the basic socio-demographic variables in the baseline and in the follow-up survey. Some of the variables are repeated measurements from both surveys; some are only available from the baseline survey, which means that the information is only available for follow-up survey respondents who participated in both surveys and whose records could be matched. When comparisons between sexes are performed it should be kept in mind that many of the women and most of the men in both surveys are parts of couples of which both partners participated.

In this section we also comment on the selectivity of dropouts. Dropouts are respondents who participated in the baseline but did not participate in the follow-up survey. Selectivity is present if the probability of dropping out of the sample is statistically correlated with the respondents' attributes. Pearson chi-square tests were performed for each socio-demographic variable. The results are presented in Table 7.

The mean age of women rises from 32.8 (range: 22-44; SD=4.4) in the baseline to 34.1 years (range: 23-44 years; SD=4.1) in the follow-up survey. This rise in the mean age can mainly be ascribed to the fact that the follow-up survey was carried out approximately one year after the baseline survey. It appears that this is also driven by a relatively low probability to stay in the sample in those younger than 29 years of age. This group amounted to 23.3 % in the baseline survey but only 12.2 % in the follow-up survey (Table 6). Compared to women, men are slightly older, but the rise in age is similar: from 36.2 (range: 23-62 years; SD=5.9) to 37.1 years (range: 26-51 years; SD=5.3). Overall, belonging to a particular age group does not influence the probability of participation in the follow-up survey in a statistically significant way (Table 7).

Also, the share of those with migration background is lower in the follow-up survey. Whereas 23.8 % of the women in the baseline survey were first or second-generation migrants, their share is about 8 percentage points lower in the follow-up. For men, the share of migrants in the baseline survey is 22 % and is reduced by 10 percentage points (Table 6). As can be observed in Table 7, the probability for first-generation migrants to participate in the follow-up survey was only 15.6 %, while it was 45.1 % for natives and 39.2 % for second-generation migrants. These differences in distribution are statistically significant, implying that there is relevant selectivity in dropouts.

The distribution of parity shows that there are far less childless persons in the follow-up in comparison with the baseline survey. For women, the share of those childless has decreased from 85 % to 56.6 %, for men from 84.6 % to 59.8 %, indicating that several women and men were successful in their attempts to have a child, either through natural conception or with the help of reproductive medicine (Table 6). Having a child at the baseline does not significantly influence the probability of taking part in the follow-up survey (Table 7).

**Table 6: Socio-demographic characteristics of the baseline and the follow-up study population**

	Baseline				Follow-up			
	Women		Men		Women		Men	
	n	% <sup>1</sup>	n	% <sup>1</sup>	n	% <sup>1</sup>	n	% <sup>1</sup>
<b>Total</b>	323		242		140		93	
<b>Age</b>								
< 29	75	23.3	25	10.5	17	12.2	5	5.4
30 - 34	131	40.9	78	32.9	57	41.0	27	29.0
35 - 39	90	28.1	71	30.0	47	33.8	35	37.6
≥ 40	24	7.5	63	26.6	18	12.9	26	28.0
Missing information <sup>2</sup>	3	0.9	5	2.1	1.0	0.7	0	0
<b>Migration Status<sup>3</sup></b>								
No migration background	243	76.2	183	77.9	115	84.6	77	87.5
First-generation migrant	46	14.4	31	13.2	11	8.1	1	1.1
Second-generation migrant	30	9.4	21	8.9	10	7.4	10	11.4
Missing information <sup>2</sup>	4	1.2	7	2.9	0	0	0	0
<b>Parity<sup>3</sup></b>								
0	173	85.0	204	84.6	77	56.6	52	59.8
1+	48	14.9	37	15.3	59	43.4	35	40.2
Missing information <sup>2</sup>	2	0.6	1	0.4	0	0	1	1.1
<b>Relationship status</b>								
Married	266	82.9	212	88.0	128	91.4	86	92.5
Not married	56	17.4	29	12.0	12	8.6	7	7.5
Missing information <sup>2</sup>	1	0.3	1	0.4	0	0	0	0
<b>Insurance coverage<sup>3</sup></b>								
Statutory	282	87.9	191	79.9	112	83.6	62	71.3
Private	39	12.1	48	20.1	22	16.4	25	28.7
Missing information <sup>2</sup>	2	0.6	3	1.2	2	1.5	1	1.1
<b>Level of education<sup>3</sup></b>								
low (ISCED 1 & 2)	9	3.0	11	4.7	1	0.8	0	0
medium (ISCED 3 & 4)	156	51.3	94	40.6	58	43.6	32	37.2
high (ISCED 5 & 6)	139	45.7	127	54.7	74	55.6	54	62.8
Missing information <sup>2</sup>	19	5.9	10	4.1	3	2.2	2	2.3
<b>Labor force status</b>								
Not employed	22	6.9	9	3.7	52	37.1	3	3.2
Self-employed	9	2.8	23	9.7				
Full-time/vocational training	228	71.5	200	84.4	69	49.3	89	95.7
Part-time/marginal employment	55	17.2	3	1.3	18	12.9	1	1.1
Working, other	5	1.6	2	0.8	0	0	0	0
Other					1	0.7	0	0
Missing information <sup>2</sup>	4	1.2	5	2.1	0	0	0	0
<b>Municipality size classes<sup>3</sup></b>								
< 2,000 inhabitants	74	23.9	57	24.6	27	20.3	19	21.8
2,000 - 4,999 inhabitants	47	15.2	33	14.2	23	17.3	13	14.9
5,000 - 19,999 inhabitants	63	20.3	43	18.5	33	24.8	20	23.0
20,000 - 99,999 inhabitants	57	18.4	45	19.4	17	12.8	14	16.1
≥ 100,000 inhabitants	69	22.3	54	23.3	33	24.8	21	24.1
Missing information <sup>2</sup>	13	4	10	4.1	3	2.2	1	0

<sup>1</sup> Percentages are based on cases with valid information.

<sup>2</sup> Percentages of cases with missing information are based on all cases.

<sup>3</sup> Variable from baseline survey or baseline survey information used for calculation (see Passet-Wittig et al. 2014), only available for follow-up survey respondents with a match in baseline (women=136; men=88).

Source: PinK Study, own calculations.

**Table 7: Selectivity of dropouts, bivariate analysis<sup>1</sup>**

	n <sup>2</sup>	Follow-up survey participation (in %)		Pearson $\chi^2$ statistic	p-value
		No	Yes		
Total	565	60.4	39.6		
<b>Sex</b>					
Male	242	63.6	36.4		
Female	323	57.9	42.1	1.906	0.167
<b>Age</b>					
< 29	100	64.0	36.0		
30 - 34	209	57.4	42.6		
35 - 39	161	59.6	40.4		
≥ 40	87	60.9	39.1	1.275	0.735
<b>Migration status</b>					
No migration background	426	54.9	45.1		
First generation migrant	77	84.4	15.6		
Second generation migrant	51	60.8	39.2	31.099	<0.001
<b>Parity</b>					
0	477	59.7	40.3		
1+	85	63.5	36.5	0.431	0.517
<b>Relationship status</b>					
Not married	85	64.7	35.3		
Married	478	59.6	40.4	0.779	0.377
<b>Insurance coverage</b>					
Statutory	473	63.2	36.8		
Private	87	46.0	54.0	9.139	0.003
<b>Level of education</b>					
Low (ISCED 1 & 2)	20	95.0	5.0		
Medium (ISCED 3 & 4)	250	64.0	36.0		
High (ISCED 5 & 6)	266	51.9	48.1	18.889	<0.001
<b>Labor force status</b>					
Not employed	31	71.0	29.0		
Self-employed	32	65.6	34.4		
Full-time/vocational training	428	58.6	41.4		
Part-time/marginal employment	58	56.9	43.1	2.483	0.478
<b>Municipality size class</b>					
< 2,000 inhabitants	131	64.9	35.1		
2,000 - 4,999 inhabitants	80	55.0	45.0		
5,000 - 19,999 inhabitants	106	50.0	50.0		
20,000 - 99,999 inhabitants	102	69.6	30.4		
≥ 100,000 inhabitants	123	56.1	43.9	11.125	0.025

<sup>1</sup> Independent variables were measured at baseline survey. For more details on the operationalization of the variables see Passet-Wittig et al. (2014).

<sup>2</sup> Number of cases on independent variables do not add up to 565 because of missing values (see table 6).

Source: PinK Study, own calculations.

The share of those married is higher in the follow-up than in the baseline survey for both women and men. In women, the share increased by almost 9 percentage points, in men by 4.5 percentage points (Table 6). Yet again, the propensity to participate in the follow-up does not differ significantly according to relationship status.

The information on insurance coverage from the baseline survey was used to compare the insurance coverage of baseline and follow-up survey respondents. The comparison

reveals similar patterns in both surveys: Men are more often privately insured than women. It is remarkable that in the follow-up both women and men are less likely to have statutory health insurance than in the baseline survey (Table 6). The propensity to participate in the follow-up is related to type of insurance coverage at baseline, as can be seen in Table 7.

Comparing the distribution of levels of education, it turns out that it changes from baseline to follow-up. For women and men, the educational level is higher in the follow-up survey. As Table 7 shows, the propensity to participate in the follow-up is 48.1 % for those with higher educational levels, while it is only 5 % for those with lower levels of education. This correlation is statistically significant.

Considerable differences between the two surveys are noticeable in the labour force status of women. In the follow-up survey, women are less likely to work full time than at baseline. This is probably due to the high number of mothers with toddlers in the follow-up on parental leave (37.1 %). Men are even more likely to have a full-time job in the follow-up than in the baseline survey, although this could be a result of not asking for self-employment in a separate category in the follow-up. We expect that self-employed men marked the category 'full-time job' instead (Table 6). The probability of taking part in the follow-up survey does not significantly depend on the labour force status in the baseline survey (Table 7).

As in the baseline, the municipality size classes show a rather equal distribution across sexes and also across surveys (Table 6). The probability of staying in the study differs depending on the size of the municipality people live in (Table 7). There is no clear explanation for the pattern.

## 6 Summary

The Pink Study provides longitudinal data about a cohort of German couples who had begun fertility treatments at a fertility clinic in Rhineland-Palatinate or in Wiesbaden (Hesse) between July 2012 and May 2013. Although the sampling was of a regional nature, we believe that findings based on this data can be beneficial for understanding the situation of patients in other parts of Germany. The interdisciplinary approach of the study, combining scientific questions from medicine, family sociology and psychology, was maintained from the first to the second survey.

Overall, 233 respondents (women=140, men=93) participated in the follow-up study, in 89 couples, both partners participated. As is evident from these numbers, men mostly participated if their partner did so as well. The longitudinal data set includes 224 respondents of both sexes. The follow-up study allows us to analyse what happened since the couples started fertility treatment. Combined with the baseline survey, longitudinal analyses on individual and couple level can be performed although the sample size for longitudinal couple analysis is admittedly small. Several questions from the baseline survey were used again (e.g. concerning attitudes towards family life and life goals, financing of treatment, health insurance and health status, socio-demographic characteristics) and new questions were included, for example regarding burdens of treatment, dyadic coping and sources of psychosocial support. Repeated questions allow for direct comparisons of changes between the baseline and follow-up survey, for example depending on the current status of treatment.

While the sampling procedure in the baseline survey had to rely on the staff of the fertility clinics who handed out the study packages to their patients, in the follow-up survey the participants were contacted directly via post. These were the respondents from the

baseline survey who gave their consent to be contacted again. 59 % of them participated in the follow-up survey, which can be considered a good result. Sending out a reminder four weeks after the main dispatch proved successful with regard to the participation rate. However, the overall response rate, which uses all baseline survey respondents as the denominator, is only 39.6 %. The loss from the first cycle of data collection to the second was systematic in terms of specific socio-demographic variables. The probability of participating in the follow-up survey was related to the migration background, particularly first-generation migrants, to the level of education and to the type of health insurance. Since these variables are oftentimes related to the economic well-being of a person, these differences could be indicative of a higher share of wealthy participants in the follow-up. This must be taken into account when interpreting the results of the study. There might also be selectivity related to the status of treatment variable: Pregnant persons or those who had a child between surveys might have a greater motivation to share their experience in the PinK Study than those who are still undergoing treatment or currently not undergoing treatment. However, from the very beginning of the study, it was difficult to determine how well the sample represented the population of patients starting fertility treatments in Germany because socio-demographic characteristics of the study population are not well known.

Even though preparations were made for a second follow-up, this will probably not be realized. It seems unlikely that a sufficiently high number of participants could be reached in order to continue quantitative analyses in a useful way.

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## 8 Appendix

### 8.1 Study Materials (Section 3)

#### Cover sheet questionnaire



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für Bevölkerungsforschung



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- 1 -

## 8.2 Questions Used for New Generated Variables (Section 5.1)

Please note that questions were translated solely for informative purposes.

	German	English
State of treatment	Vor wie vielen Monaten haben Sie zuletzt ein Kinderwunschzentrum aufgesucht?	How many months ago did you last visit a fertility treatment clinic?
	1 Monat oder weniger ( <i>bitte weiter mit Frage 3</i> ) Mehr als 1 Monat: __ Monate ( <i>bitte Anzahl Monate eintragen</i> )	1 month ago or less ( <i>please continue with question 3</i> ) More than 1 month ago: __ months ( <i>please enter number of months</i> )
	Sind Sie zurzeit – von einem Arzt bestätigt – schwanger? Nein Ja	Are you currently pregnant, as diagnosed by a physician? No Yes
	Haben Sie in den letzten 12 Monaten mindestens 1 Kind geboren? Nein Ja	Did you have at least 1 child in the past 12 months?  No Yes
Labor Force Status (follow-up survey)	Was machen Sie zurzeit? Wenn mehrere Tätigkeiten auf Sie zutreffen, dann kreuzen Sie bitte alle an.	Which description fits your current education and employment situation? You can pick multiple answers.
	Abendschule, Kolleg, 2. Bildungsweg Berufliche Ausbildung (Ausbildung/ Lehre/Berufsfachschule oder Handelsschule u. a.	Evening school, working on a school-leaving certificate for adults Vocational training/apprenticeship
	Umschulung/Weiterbildung	Vocational retraining/continuing education
	Berufsakademie	University of cooperative education
	Fachhochschule, Hochschule, Universität	University of applied sciences, college, university
	Berufsvorbereitende Maßnahmen	Pre-vocational training
	Fachschulen (z. B. Meister-, Technikerschule)	Technical/professional school (e.g., certified master craftsman, certified technician)
	Sonstige Ausbildung	Other education
	Voll erwerbstätig	Full-time employment
	Selbstständig	Self employment
	Teilzeitbeschäftigt (auch bei parallelen Teilzeittätigkeiten)	Part-time employment (also multiple part-time jobs)
	Praktika, Trainee, Volontariat o. ä. (auch unbezahlt)	Internship, trainee, work experience etc. (including unpaid work)

	German	English
Labor Force Status (follow-up survey)	Geringfügig erwerbstätig, Mini-Job, „Ein-Euro-Job“ (bei Bezug von Arbeitslosengeld 2)	Marginal part-time employment, mini-job, ‘Ein-Euro-Job’ (‘one-euro job,’ when receiving unemployment benefits)
	Gelegentlich oder unregelmäßig beschäftigt	Occasionally or irregularly employed
	Sonstige Erwerbstätigkeit Mutterschafts-, Erziehungsurlaub, Elternzeit, oder sonstige Beurlaubung	Other type of job Maternity or paternity leave or other leave of absence
	Freiwilliges soziales Jahr, Bundesfreiwilligendienst	Alternative civilian service, voluntary social service year
	Arbeitslos, arbeitssuchend	Unemployed, seeking employment
	Hausfrau/Hausmann	Housewife/househusband
	Vorruheständler, Rentner, berufsunfähig	Retired, occupational disability
	Sonstige, nicht erwerbstätig	Other, not employed
Parity (follow-up survey)	Haben Sie in den letzten 12 Monaten mindestens 1 Kind geboren? Nein Ja	Did you have at least 1 child in the past 12 months? No Yes
	Wie viele Kinder haben Sie in den letzten 12 Monaten geboren? 1 Kind 2 Kinder 3 Kinder Mehr als 3 Kinder	How many children have you had in the past 12 months? 1 child 2 children 3 children More than 3 children
Relationship status (follow-up survey)	Sind Sie noch mit demselben Partner wie zum Zeitpunkt der letzten Befragung vor 12 Monaten zusammen?	Are you still in a relationship with the same partner as during the last survey 12 months ago?
	Ich bin noch mit demselben Partner zusammen	I am still with the same partner
	Wir haben uns getrennt/Wir trennen uns gerade	We are separated/separating
	Ich habe einen neuen Partner	I have a new partner
	Ich habe aktuell keinen Partner	I am currently single
	Sind Sie mit Ihrem aktuellen Partner verheiratet? Nein Ja	Are you married to your current partner? No Yes
	Ich habe aktuell keinen Partner	I am currently single

### 8.3 Personal Code Used for Matching Questionnaires between Basic and Follow-up Survey (Section 5.2)

Please note that the question was translated solely for informative purposes.

German	English
<b>Persönlicher Code</b>	<b>Personal code</b>
Bitte füllen Sie den folgenden persönlichen Code aus.	Please fill in the following personal code.
Dieser Code dient in der geplanten Studie ausschließlich dazu, Fragebögen einer möglichen Folgebefragung einander zuordnen zu können, ohne auf eine Person schließen zu können.	In the planned study, this code serves solely to allocate questionnaires from a possible follow-up survey to this one, but not to you personally.
In dieser Vorstudie wollen wir nur ermitteln, ob der Code für Sie verständlich und für diese Zwecke geeignet ist. Ihr erstellter Code wird in keiner Weise weiter verwendet werden.	In this pretest, we only wish to learn whether the code is understandable to you and suitable for this purpose. The code you create will not be used for any other purpose.
Bitte tragen Sie in das nebenstehende Feld Ihre persönliche ID ein.	Please enter your personal ID in the following field.
Ihre ID wird wie folgt ermittelt:	Your ID is created as follows:
1. Die ersten beiden Buchstaben Ihres Geburtsortes (z. B. Frankfurt)	1. The first two letters of your town of birth (e.g. Frankfurt)
2. Die Tagesangabe Ihres Geburtstags (z. B. 10.03.1985)	2. Your day of birth (e.g. 03/10/1985)
3. Die ersten beiden Buchstaben des ersten Vornamens Ihrer Mutter (z. B. Susanne)	3. The first two letters of your mother's first name (e.g. Susanne)
4. Die ersten beiden Buchstaben Ihres ersten Vornamens (z. B. Mareike)	4. The first two letters of your own first name (e.g. Mareike)
5. Die letzten beiden Buchstaben Ihres Nachnamens bei Geburt (z. B. Müller)	5. The last two letters of your last name at birth (e.g. Müller)
Beispiel:	Example:
F r 1 0 S u M a e r	F r 1 0 S u M a e r
Ihr persönlicher Code:	Your personal code:
_____	_____